



Testimony

Before the Select Committee
on the Climate Crisis,
House of Representatives

CLIMATE RESILIENCE

A Strategic Investment Approach for High-Priority Projects Could Help Target Federal Resources

Accessible Version

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Chairwoman Castor, Ranking Member Graves, and Members of the Select Committee:

Thank you for the opportunity to discuss our recent work on climate resilience and federal investment strategies. Since 2005, federal funding for disaster assistance has totaled at least \$450 billion, including a 2019 supplemental appropriation of \$19.1 billion for recent disasters. In 2018 alone, 14 separate billion-dollar weather and climate disaster events occurred across the United States, with total costs of at least \$91 billion, including the loss of public and private property, according to the National Oceanic and Atmospheric Administration. Disaster costs likely will increase as certain extreme weather events become more frequent and intense due to climate change, according to the U.S. Global Change Research Program, a global change research coordinating body that spans 13 federal agencies.¹

The cost of recent weather disasters has illustrated the need to plan for climate change risks and invest in climate resilience. In 2013, we included “Limiting the Federal Government’s Fiscal Exposure by Better Managing Climate Change Risks” on our list of federal program areas at high risk of fraud, waste, abuse, and mismanagement or most in need of transformation.² Enhancing climate resilience means taking actions to reduce potential future losses by planning and preparing for potential climate hazards such as extreme rainfall, sea level rise, and drought. Investing in climate resilience can reduce the need for far more costly steps in the decades to come; therefore, we and others have

¹U. S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment*, vol. 2 (Washington, D.C.: 2018).

²Every 2 years, at the start of a new Congress, GAO reevaluates agency progress in addressing issues on the high-risk list against five criteria to determine if progress has been made. The criteria are: (1) leadership commitment to address the risk, (2) agency capacity to resolve the risk, (3) a corrective action plan to addressing the risk, (4) a program to monitor the effectiveness of corrective measures, and (5) ability to demonstrate progress in resolving the high-risk area. GAO, *High-Risk Series: An Update*, [GAO-13-283](#) (Washington, D.C.: February 2013).

recommended enhancing climate resilience to help limit the federal government's fiscal exposure to climate change.³

Planning for federal investments in climate resilience projects to limit fiscal exposure is no longer a hypothetical issue. The Disaster Recovery Reform Act of 2018 provides one potential source of funding for climate resilience projects.⁴ In particular, it allows the President to set aside up to 6 percent of the estimated aggregate amount of grants from certain emergency programs under a major disaster declaration to implement pre-disaster hazard mitigation activities. The Federal Emergency Management Agency (FEMA) will administer the associated program—the Building Resilient Infrastructure and Communities program. As of the date of this testimony, FEMA had not yet developed program guidance, although the agency has sought input from the public on program design.⁵ FEMA officials estimate annual funds for the program will average \$300 million to \$500 million.

My statement today focuses on (1) the extent to which the federal government has a strategic approach for investing in climate resilience projects; (2) key steps that provide an opportunity to strategically prioritize projects for investment; and (3) the strengths and limitations of options for focusing federal funding on these projects. My statement is based on the findings of our October 2019 report on climate resilience.⁶ To perform the work for our report, we reviewed about 50 relevant reports and

³See GAO, *Climate Change: Opportunities to Reduce Federal Fiscal Exposure*, [GAO-19-625T](#) (Washington, D.C.: June 11, 2019), *Climate Change: Selected Governments Have Approached Adaptation through Laws and Long-Term Plans*, [GAO-16-454](#) (Washington, D.C.: May 12, 2016), and National Research Council of the National Academies, *America's Climate Choices: Panel on Adapting to the Impacts of Climate Change*, *Adapting to the Impacts of Climate Change* (Washington, D.C.: 2010).

⁴FAA Reauthorization Act of 2018, Pub. L. No. 115-254, div. D, §§ 1206(a)(3), 1234(a)(5) 132 Stat. 3186, 3440, 3462 (2018). The FAA Reauthorization Act of 2018, which included the Disaster Recovery Reform Act of 2018, became law on October 5, 2018.

⁵According to an October 2019 FEMA Disaster Recovery Reform Act Annual Report, FEMA plans to publish a draft policy for the Building Resilient Infrastructure and Communities program in 2020 for public comment. Furthermore, FEMA anticipates releasing the first Notice of Funding Opportunity in summer 2020 and plans to open the application period in September 2020. See Department of Homeland Security, Federal Emergency Management Agency, *Disaster Recovery Reform Act (DRRA) Annual Report* (Washington, D.C.: October 2019).

⁶GAO, *Climate Resilience: A Strategic Investment Approach for High-Priority Projects Could Help Target Federal Resources*, [GAO-20-127](#) (Washington, D.C.: Oct. 23, 2019).

interviewed 35 stakeholders with expertise in climate resilience and related fields, including federal officials, researchers, and consultants. In addition, during the course of this work, we identified domestic and international examples of governments that invested in climate resilience and related projects. We selected two of these examples for in-depth review and presentation in our report: the state of Louisiana's coastal master planning effort and Canada's Disaster Mitigation and Adaptation Fund. Additional information on our scope and methodology is available in our October 2019 report.⁷

We conducted the work on which this statement is based in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The Federal Government Has Invested in Projects That May Convey Some Climate Resilience Benefits but Does Not Have a Strategic Investment Approach

As we reported in October 2019, the federal government has invested in projects that may enhance climate resilience but does not have a strategic approach for investing in high-priority climate resilience projects. Some federal agencies have made individual efforts to manage climate change risk within existing programs and operations, and these efforts may convey climate resilience benefits. For example, the U.S. Army Corps of Engineers' civil works program constructs flood control projects, such as sea walls, that could convey climate resilience benefits by protecting communities from storms that may be exacerbated by climate change.

However, even with individual agency efforts, federal investment in projects specifically designed to enhance climate resilience to date has been limited. As we stated in our Disaster Resilience Framework, most of

⁷[GAO-20-127](#).

the federal government's efforts to reduce disaster risk are reactive, and many revolve around disaster recovery.⁸ As a result, we reported in October 2019 that additional strategic federal investments may be needed to manage some of the nation's most significant climate risks because climate change cuts across agency missions and presents fiscal exposures larger than any one agency can manage. Our analysis shows the federal government does not strategically identify and prioritize projects to ensure they address the nation's most significant climate risks.

In addition, our October 2019 report discusses our past work that shows an absence of government-wide strategic planning for climate change. For example, in our March 2019 update to our high-risk list, we reported that one area of government-wide action needed to reduce federal fiscal exposure is in the federal government's role as the leader of a strategic plan that coordinates federal efforts and informs state, local, and private-sector action.⁹ For this 2019 update, we assessed the federal government's progress since 2017 related to climate change strategic planning against five criteria and found that the federal government had not met any of the criteria for removal from the high-risk list. Specifically, since our 2017 high-risk update, four ratings regressed to "not met" and one remained unchanged as "not met."

Also, although we have made 17 recommendations that address improving federal climate change strategic planning, as of August 2019, no action had been taken toward implementing 14 of those recommendations—including one dating from 2003. Our enterprise risk management framework calls for reviewing risks and selecting the most appropriate strategy to manage them.¹⁰ However, no federal agency, interagency collaborative effort, or other organizational arrangement has been established to implement a strategic approach to climate resilience investment that includes periodically identifying and prioritizing projects.

⁸GAO, *Disaster Resilience Framework: Principles for Analyzing Federal Efforts to Facilitate and Promote Resilience to Natural Disasters*, [GAO-20-100SP](#) (Washington: D.C.: October 2019). The principles in this framework can help identify opportunities to enhance federal efforts to promote disaster resilience, including building resilience to climate change.

⁹GAO, *High-Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, [GAO-19-157SP](#) (Washington, D.C.: Mar. 6, 2019).

¹⁰GAO, *Enterprise Risk Management: Selected Agencies' Experiences Illustrate Good Practices in Managing Risk*, [GAO-17-63](#) (Washington, D.C.: Dec. 1, 2016).

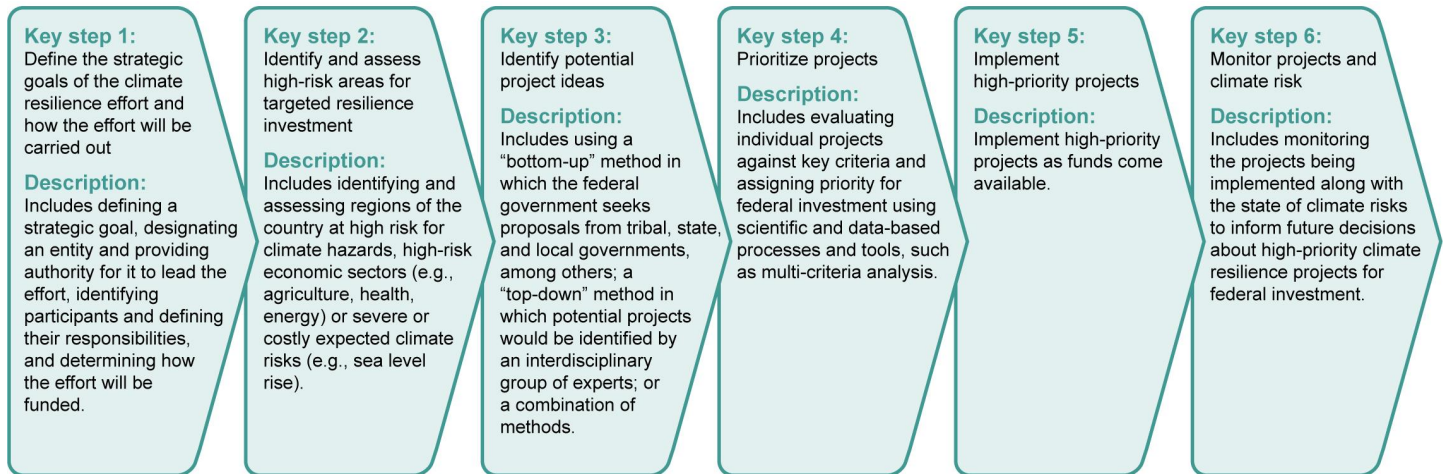
Such an approach could supplement individual agency climate resilience efforts and help target federal resources toward high-priority projects.

Six Key Steps Provide an Opportunity for the Federal Government to Strategically Identify and Prioritize Climate Resilience Projects

Six key steps provide an opportunity for the federal government to strategically identify and prioritize climate resilience projects for investment, based on our review of reports (including a National Academies report and the U.S. Global Change Research Program's Fourth National Climate Assessment) that discuss adaptation as a risk management process, as well as on international standards, our past work (including our enterprise risk management criteria), and interviews with stakeholders.¹¹ The six key steps are (1) defining the strategic goals of the climate resilience investment effort and how the effort will be carried out, (2) identifying and assessing high-risk areas for targeted resilience investment, (3) identifying potential project ideas, (4) prioritizing projects, (5) implementing high-priority projects, and (6) monitoring projects and climate risks. (See fig. 1.)

¹¹See National Research Council of the National Academies, America's Climate Choices: Panel on Adapting to the Impacts of Climate Change, *Adapting to the Impacts of Climate Change* (Washington, D.C.: 2010); U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment*, vol. 2 (Washington, D.C.: 2018); International Organization for Standardization, ISO 14090:2019, *Adaptation to Climate Change—Principles, Requirements and Guidelines* (June 2019); and ASTM International, Standard ASTM E3032-15e1: *Guide for Climate Resiliency Planning and Strategy* (2015). The International Organization for Standardization is a worldwide federation of national standards bodies. ASTM International develops voluntary consensus industry standards.

Figure 1: Key Steps for Identifying High-Priority Climate Resilience Projects for Federal Investment



Source: GAO analysis based on relevant reports, international standards, past GAO work, and stakeholder interviews. | GAO-20-317T

In our October 2019 report, we used one domestic and one international example to illustrate these key steps: Louisiana’s Coastal Protection and Restoration Authority (CPRA) coastal master planning effort and Canada’s Disaster Mitigation and Adaptation Fund (DMAF).

In the domestic example, to address the lack of strategic coordination, in 2005 the state of Louisiana consolidated coastal planning efforts previously carried out by multiple state entities into a single effort, led by CPRA. CPRA periodically identifies high-priority coastal resilience projects designed to address two primary risks: flooding and coastal land loss. To identify potential projects, CPRA sought project proposals from citizens, nongovernmental organizations, and others. To prioritize projects, CPRA used quantitative modeling to estimate project outcomes under multiple future scenarios of varied climate and other conditions and coordinated with stakeholders to understand potential project impacts. CPRA has published three coastal master plans in which it identified and evaluated potential projects. For example, in its 2017 Comprehensive Master Plan for a Sustainable Coast, CPRA identified \$50 billion in high-priority projects to be implemented as funding becomes available.

In the international example, in 2018 the Canadian government launched the DMAF, a financial assistance program, to provide \$1.5 billion (in U.S. dollars) over 10 years for large-scale, nationally significant projects to manage natural hazard risks, including those triggered by climate change. Infrastructure Canada, the entity responsible for administering the DMAF,

seeks project ideas from provinces and territories, municipal and regional governments, indigenous groups, and others. These entities apply directly to Infrastructure Canada for funding. According to Canadian officials, two committees of experts—one composed of experts from other federal departments and the other composed of nonfederal experts (e.g., urban planners and individuals with regional expertise)—provide feedback on potential projects. These projects are prioritized based on multiple criteria such as the extent to which they reduce the impacts of natural disasters.

Options for Focusing Federal Funding on High-Priority Climate Resilience Projects Have Strengths and Limitations, and Opportunities Exist to Increase Funding Impact

As we reported in October 2019, on the basis of our review of relevant reports and our past work, interviews with stakeholders, and illustrative examples, we identified two options—each with strengths and limitations—for focusing federal funding on high-priority climate resilience projects. The options are (1) coordinating funding provided through multiple existing programs with varied purposes and (2) creating a new federal funding source specifically for investment in climate resilience. In addition, our analysis of these sources identified opportunities to increase the climate resilience impact of these two funding options.

A strength of coordinating funding from existing sources is access to multiple funding sources for a project. For example, one stakeholder we interviewed whose community used federal funding to implement large-scale resilience projects said that having multiple programs is advantageous because when funding from one program is not available—such as when the project does not match that program’s purpose or when there are insufficient funds—funds could be sought from another program. The state of Louisiana’s coastal master planning effort also uses multi-program coordination to fund projects. Specifically, funding for high-priority resilience projects identified in the master plan is provided via several federal and nonfederal programs designed for wetlands restoration, hurricane risk reduction, oil spill recovery, and community development, among other purposes. A limitation of that option, according to CPRA officials, is that coordinating funding from multiple sources could be administratively challenging and could require dedicated staff to

identify programs, assess whether projects meet program funding criteria, apply for funds, and ensure program requirements are met.

Alternatively, one strength of creating a new federal funding source, such as a federal financial assistance program that could provide loans or grants or a climate infrastructure bank, is that it could encourage cross-sector projects designed to achieve benefits in multiple sectors. For example, according to one stakeholder, such a funding source could allow experts from multiple sectors—such as infrastructure, housing, transportation, and health—to collaborate on projects, leading to more creative, comprehensive approaches to enhance community resilience. However, such a new funding source would have to be created, which would require congressional authorization.

In addition, we identified opportunities to increase the climate resilience impact of federal funding options based on our review of our past work, related reports, an international standard, and the Louisiana and Canadian examples, as well as interviews with stakeholders:

- **Using both existing and new funding options.** Several stakeholders told us that using both funding options—multiple, existing federal programs with varied purposes and a new funding source for high-priority climate resilience projects—in a strategic, coordinated way could help increase the impact of federal investment. Two stakeholders told us that in practice, multiple, existing federal funding sources that are not specific to climate resilience could be coordinated to fund projects when their purposes and rules align and adequate funding is available. A funding source specifically for climate resilience could be used to fund proposed projects when no related program exists or when existing programs do not have sufficient funding available, according to these and other stakeholders.
- **Helping ensure adequate and consistent funding.** Several stakeholders we interviewed identified the need for adequate and consistent funding to implement high-priority climate resilience projects. For example, according to one stakeholder we interviewed, inconsistent, inadequate funding makes it difficult to complete large-scale projects and can lead to additional costs if significant delays occur during which existing work deteriorates. In addition to adequate and consistent funding, funding options should be designed to accommodate long-term projects since high-priority climate resilience projects can take multiple years to design and implement, according to two stakeholders we interviewed.

- **Encouraging nonfederal investment.** Several stakeholders we interviewed told us that the federal government could use a federal climate resilience investment effort to encourage nonfederal investment in high-priority climate resilience projects, thereby increasing the impact of federal investment. For example, several stakeholders identified the importance of a cost-share component so that funding recipients are invested in a project's success. Canada's DMAF encourages nonfederal investment by partially funding projects of national significance and requiring different levels of cost-share from funding recipients, ranging from 25 percent for indigenous recipients to 75 percent for private-sector and other for-profit recipients. Several stakeholders also identified potential funding mechanisms—for example, public-private partnerships and loan guarantees—that could leverage federal dollars to encourage additional investment in climate resilience projects by nonfederal entities, including the private sector.
- **Encouraging complementary resilience activities.** To increase the impact of federal investment in climate resilience, a federal investment effort presents an opportunity to encourage complementary resilience activities by nonfederal actors such as states, localities, and private-sector partners, based on interviews with several stakeholders, the Canadian example, and reports we reviewed. For example, this could include establishing conditions that funding recipients must meet in exchange for receiving federal funding. Alternatively, the federal government could use incentives (e.g., providing greater federal cost-share or giving additional preference in the project prioritization process) to encourage complementary resilience activities by nonfederal actors. Our Disaster Resilience Framework states that incentives can make long-term, forward-looking risk reduction investments more viable and attractive among competing priorities.¹² The federal government could use these conditions and incentives to encourage several types of complementary resilience activities by nonfederal actors. For example, the federal government could encourage the use and enforcement of building codes that require stronger risk-reduction measures. In addition, a federal investment effort could provide an opportunity to encourage communities to limit or prohibit development in high-risk areas to minimize risks to people and assets exposed to future climate hazards. One example of this would be through zoning regulations. Another stakeholder suggested that communities receiving federal funding for resilience projects

¹²[GAO-20-100SP](#).

should be adequately insured against future climate risks so they have a potential source of funding for rebuilding in the event of a disaster.

- **Allowing funds to be used at various stages of project development.** Several stakeholders suggested that federal funds be used for multiple stages of project development—such as project design, implementation, or monitoring—to increase the impact of federal funds. For example, two stakeholders we interviewed told us that resilience projects can require significant amounts of design work to develop an implementable and effective project concept and that making funds available for project design could improve the quality of project proposals, thereby maximizing the impact of federal funds. In addition to providing federal funds for project design, one stakeholder suggested making federal funding available to measure project outcomes (e.g., how effectively projects increased resilience) to improve future decisions by both the federal government and others making resilience investments.

Based on the findings of our October 2019 report, we recommended that Congress consider establishing a federal organizational arrangement to periodically identify and prioritize climate resilience projects for federal investment. Such an arrangement could be designed using the six key steps for prioritizing climate resilience investments and the opportunities to increase the climate resilience impact of federal funding options that we identified in our report.

Chairwoman Castor, Ranking Member Graves, and Members of the Select Committee, this completes my prepared statement. I would be pleased to respond to any questions that you may have at this time.

GAO Contact and Staff Acknowledgments

If you or your staff have any questions about this testimony, please contact Mark Gaffigan at (202) 512-3841 or gaffiganm@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement.

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